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EXAMINER	
THOMPSON, JAMES A	
ART UNIT	**PAPER NUMBER**
2625	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/859,501	SOEDA ET AL.	
	Examiner	Art Unit	
	James A. Thompson	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 27 October 2006.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 18 May 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

DOUGLAS Q. TRAN
PRIMARY EXAMINER

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 27 October 2006 have been fully considered but they are not persuasive. Applicant's arguments are directed to the present amendments to the claims. Examiner has fully reconsidered the prior art references thus far cited and considers the combination of Orito (US Patent 6,072,912), Yamamoto (US Patent 4,841,376) and Arimoto (US Patent 5,371,613) to fully teach the presently recited independent claims. By combining the teachings of Arimoto with the teachings of Orito and Yamamoto, the limitations included by the present amendments to the independent claims are taught, as set forth in detail in the prior art rejections below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1-2, 5-8, 11-12 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orito (US Patent 6,072,912) in view of Yamamoto (US Patent 4,841,376) and Arimoto (US Patent 5,371,613).**

Regarding claims 1 and 11: <u>Orito discloses</u> an image reading device (figure 5 of Orito) comprising:

- a photoelectric device (figure 5(54) of Orito) including a plurality of pixels (column 5, lines 48-52 of Orito) and provided with an empty transfer part (column 5, lines 52-58 of Orito).
- an A-D converter (figure 5(61) of Orito) performing A-D conversion on an output signal for each pixel of said photoelectric device (column 6, lines 20-26 of Orito). Since the binarization circuit (figure 5(61) of Orito) digitizes the input data (column 6, lines 20-26 of Orito), said binarization circuit is clearly an A-D converter.
- a reference voltage varying part (figure 5(70(portion)) of Orito) varying a reference voltage (level) (column 6, lines 20-26 of Orito) to vary between first (column 5, lines 58-62 of Orito),

second (column 5, lines 52-55 of Orito) and third (column 5, lines 55-58 of Orito) reference voltages based on a current mode of an image scanner (column 5, lines 52-62 of Orito), the first reference voltage selected for a background removal function (column 5, lines 58-62 and column 9, lines 39-45 of Orito), and one of the second and third reference voltages being selected when the background removal function is not used (column 5, lines 52-58 of Orito). Three separate reference levels are selected between. A first reference level is for reading image data (column 5, lines 58-62 of Orito), which includes the function of background removal (column 9, lines 39-45 of Orito). By subtracting the black average values from the image data (GD(n)-B(n)) (column 9, lines 39-45 of Orito), the background level is removed. If image data is not read, then either white level data or black level data are determined (column 5, lines 52-58 of Orito). Since all image data read by the photoelectric device are specific-ally converted to voltages (column 6, lines 20-26 of Orito), the first, second and third reference levels can also be considered reference voltages. Furthermore, the white level data and black level data are determined without respect to background removal (column 7, lines 50-58 and column 8, lines 5-11 of Orito).

- a detecting part (figure 5(70(portion)) of Orito) detecting a black correction reference data from an output signal for each pixel of said photoelectric device (column 8, lines 5-11 of Orito).
- a black shading correcting part (figure 5(70(portion)) of Orito) subtracting the black correction reference data (B(n)) from digital image data (GD(n)) obtained from the output signal for each pixel of said photo-electric device when an image is read (column 9, lines 39-45 of Orito).
- a correcting part (figure 5(70(portion)) of Orito) correcting the black correction reference data by a relation between a first digital black level value (1BA*n*) obtained from an output voltage level of said empty transfer part (column 5, lines 52-58 of Orito) obtained through said A-D converter (column 6, lines 20-26 of Orito) when the black correction reference data is detected (column 8, line 64 to column 9, line 7 of Orito) and a second digital black level value (2BA*n*) obtained from an output voltage level of said empty transfer part (column 5, lines 52-58 of Orito) obtained through said A-D converter (column 6, lines 20-26 of Orito) also when said black correction reference is detected (column 8, line 64 to column 9, line 7 of Orito).

→ A control unit (figure 5(70) of Orito) is used to control the scanner (column 5, line 65 to column 6, line 5 of Orito). Thus, the reference voltage varying part, detecting part, black shading correcting part, and correcting part are the portions of the physically-embodied software, executed by the CPU (figure 5(71) of Orito) which forms a portion of the control unit, which

perform the functions of the reference voltage varying part, detecting part, black shading correcting part, and correcting part, respectively.

Orito does not disclose expressly that the empty transfer part outputting an empty transfer level corresponds to black dummy pixels which are always shaded; that the reference voltage varying part varies the reference voltage of said A-D converter; that said black shading correcting part subtracts said black correction reference data through said A-D converter having said reference voltage set therein; that said relation between said first digital black level value and said second digital black level value is a ratio; and that said second digital black level value is obtained when the image is read.

Yamamoto discloses varying a reference voltage (Vref) of an A-D converter (figure 1(19) of Yamamoto) to correct input image data (column 4, lines 16-29 of Yamamoto); and subtracting reference data through said A-D converter having said reference voltage set therein (column 4, lines 26-40 of Yamamoto).

Orito and Yamamoto are combinable because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the reference varying and black shading correction taught by Orito by directly adjusting the reference voltage of the A-D converter, as taught by Yamamoto. The suggestion for doing so would have been that the input image data can be corrected in real time by directly varying the reference voltage of the A-D converter (column 1, lines 58-62 of Yamamoto), instead correcting stored image data after the image data has been collected, as taught by Orito. Therefore, it would have been obvious to combine Yamamoto with Orito.

Orito in view of Yamamoto does not disclose expressly that the empty transfer part outputting an empty transfer level corresponds to black dummy pixels which are always shaded; that said relation between said first digital black level value and said second digital black level value is a ratio; and that said second digital black level value is obtained when the image is read.

Arimoto discloses:

- a separate constant intensity value data transfer part (second standard member) outputting a constant intensity level corresponding to pixels of a constant intensity which are always shaded (column 22, line 66 to column 23, line 10 of Arimoto).
- correcting reference data (Wave') by a ratio (column 9, lines 21-25 of Arimoto) between a first digital level (Pave) obtained when the reference data is detected (column 7, lines 8-12 of

Arimoto) and a second digital level (Wave) obtained when the image is read (column 7, lines 4-7 of Arimoto).

Orito in view of Yamamoto is combinable with Arimoto because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use a separate section away from the normal scanning region for determining a specific constant intensity value, as taught by Arimoto, wherein said specific constant intensity value is black, as taught by Orito. Thus, by scanning in and obtaining values for a separate standard member, as taught by Arimoto, the empty transfer part outputting an empty transfer level will correspond to black dummy pixels which are always shaded. The motivation for doing so would have been to correct for unevenness in the video signal without having to worry about the effects of changes over time, stains, and so forth (column 23, lines 2-10 of Arimoto). Furthermore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to specifically use a ratio as the relation between two digital level values, wherein the second one is taken from data obtained during an image read operation, as taught by Arimoto, wherein the two digital level values are the first digital black level and the second digital black level taught by Orito. The motivation for doing so would have been that the originally installed reference regions deteriorate over time (column 2, lines 13-21 of Arimoto), and applying the correction taught by Arimoto eliminates this problem and allows for convenient automatic compensation for density changes in the reference level producing regions (column 2, lines 24-29 of Arimoto). Therefore, it would have been obvious to combine Arimoto with Orito in view of Yamamoto to obtain the invention as specified in claims 1 and 11.

Regarding claims 2 and 12: <u>Orito discloses</u> an image reading device (figure 5 of Orito) comprising:

- a photoelectric device (figure 5(54) of Orito) including a plurality of pixels (column 5, lines 48-52 of Orito) and an empty transfer part (figure 4(51) and column 5, lines 52-58 of Orito).
- an empty transfer part output generating part (figure 5(70(portion)) of Orito) falsely generating an output of the empty transfer part of said photoelectric device by output-ting a predetermined voltage at a predetermined timing (column 5, lines 52-58 of Orito). The white level data and black level data produced by the empty transfer part output generating part are clearly false outputs since said white level data and black level data are used to calibrate the scanner, and are not image data outputs. Since the white level data and black level data are produced at specific pixel locations (column 5, lines 52-58 of Orito), then the white level data and black level data are

produced at a predetermined timing, namely the timing corresponding to when the CCDs of the image sensor are located at the positions in which the white level data and black level data are read.

- an A-D converter (figure 5(61) of Orito) performing A-D conversion on an output signal for each pixel of said photoelectric device (column 6, lines 20-26 of Orito).
- a reference voltage varying part (figure 5(70(portion)) of Orito) varying a reference voltage (level) (column 6, lines 20-26 of Orito) to vary between first (column 5, lines 58-62 of Orito), second (column 5, lines 52-55 of Orito) and third (column 5, lines 55-58 of Orito) reference voltages based on a current mode of an image scanner (column 5, lines 52-62 of Orito), the first reference voltage selected for a background removal function (column 5, lines 58-62 and column 9, lines 39-45 of Orito), and one of the second and third reference voltages being selected when the background removal function is not used (column 5, lines 52-58 of Orito). Three separate reference levels are selected between. A first reference level is for reading image data (column 5, lines 58-62 of Orito), which includes the function of background removal (column 9, lines 39-45 of Orito). By subtracting the black average values from the image data (GD(n)-B(n)) (column 9, lines 39-45 of Orito), the background level is removed. If image data is not read, then either white level data or black level data are determined (column 5, lines 52-58 of Orito). Since all image data read by the photoelectric device are specific-ally converted to voltages (column 6, lines 20-26 of Orito), the first, second and third reference levels can be considered reference voltages. Furthermore, the white level data and black level data are determined without respect to background removal (column 7, lines 50-58 and column 8, lines 5-11 of Orito).
- a detecting part (figure 5(70(portion)) of Orito) detecting a black correction reference data from an output signal for each pixel of said photoelectric device (column 8, lines 5-11 of Orito).
- a black shading correcting part (figure 5(70(portion)) of Orito) subtracting the black correction reference data (B(n)) from digital image data (GD(n)) obtained from the output signal for each pixel of said photoelectric device when an image is read (column 9, lines 39-45 of Orito).
- a correcting part (figure 5(70(portion)) of Orito) correcting the black correction reference data by a relation of a first digital black level value (1BA*n*) obtained from an output voltage level of said empty transfer part output generating part (column 5, lines 52-58 of Orito) obtained through said A-D converter (column 6, lines 20-26 of Orito) when the black correction reference data is detected (column 8, line 64 to column 9, line 7 of Orito) and a second digital black level value (2BA*n*) obtained from an output voltage level of said empty transfer part output generating part

(column 5, lines 52-58 of Orito) obtained through said A-D converter (column 6, lines 20-26 of Orito) also when said black correction reference is detected (column 8, line 64 to column 9, line 7 of Orito).

→ A control unit (figure 5(70) of Orito) is used to control the scanner (column 5, line 65 to column 6, line 5 of Orito). Thus, the empty transfer part output generating part, reference voltage varying part, detecting part, black shading correcting part, and correcting part are the portions of the physically-embodied software, executed by the CPU (figure 5(71) of Orito) which forms a portion of the control unit, which perform the functions of the empty transfer part output generating part, reference voltage varying part, detecting part, black shading correcting part, and correcting part, respectively.

Orito does not disclose expressly that the empty transfer part outputting an empty transfer level corresponds to black dummy pixels which are always shaded; that the reference voltage varying part varies the reference voltage of said A-D converter; that the reference voltage varying part varies the reference voltage of said A-D converter; that said black shading correcting part subtracts said black correction reference data through said A-D converter having said reference voltage set therein; that said relation between said first digital black level value and said second digital black level value is a ratio; and that said second digital black level value is obtained when the image is read.

Yamamoto discloses varying a reference voltage (Vref) of an A-D converter (figure 1(19) of Yamamoto) to correct input image data (column 4, lines 16-29 of Yamamoto); and subtracting reference data through said A-D converter having said reference voltage set therein (column 4, lines 26-40 of Yamamoto).

Orito and Yamamoto are combinable because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the reference varying and black shading correction taught by Orito by directly adjusting the reference voltage of the A-D converter, as taught by Yamamoto. The suggestion for doing so would have been that the input image data can be corrected in real time by directly varying the reference voltage of the A-D converter (column 1, lines 58-62 of Yamamoto), instead correcting stored image data after the image data has been collected, as taught by Orito. Therefore, it would have been obvious to combine Yamamoto with Orito.

Orito in view of Yamamoto does not disclose expressly that the empty transfer part outputting an empty transfer level corresponds to black dummy pixels which are always shaded; that the reference

voltage varying part varies the reference voltage of said A-D converter; that said relation of said first digital black level value and said second digital black level value is a ratio; and that said second digital black level value is obtained when the image is read.

Arimoto discloses:

- a separate constant intensity value data transfer part (second standard member) outputting a constant intensity level corresponding to pixels of a constant intensity which are always shaded (column 22, line 66 to column 23, line 10 of Arimoto).
- correcting reference data (Wave') by a ratio (column 9, lines 21-25 of Arimoto) of a first digital level (Pave) obtained when the reference data is detected (column 7, lines 8-12 of Arimoto) and a second digital level (Wave) obtained when the image is read (column 7, lines 4-7 of Arimoto).

Orito in view of Yamamoto is combinable with Arimoto because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use a separate section away from the normal scanning region for determining a specific constant intensity value, as taught by Arimoto, wherein said specific constant intensity value is black, as taught by Orito. Thus, by scanning in and obtaining values for a separate standard member, as taught by Arimoto, the empty transfer part outputting an empty transfer level will correspond to black dummy pixels which are always shaded. The motivation for doing so would have been to correct for unevenness in the video signal without having to worry about the effects of changes over time, stains, and so forth (column 23, lines 2-10 of Arimoto). Furthermore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to specifically use a ratio as the relation between two digital level values, wherein the second one is taken from data obtained during an image read operation, as taught by Arimoto, wherein the two digital level values are the first digital black level and the second digital black level taught by Orito. The motivation for doing so would have been that the originally installed reference regions deteriorate over time (column 2, lines 13-21 of Arimoto), and applying the correction taught by Arimoto eliminates this problem and allows for convenient automatic compensation for density changes in the reference level producing regions (column 2, lines 24-29 of Arimoto). Therefore, it would have been obvious to combine Arimoto with Orito in view of Yamamoto to obtain the invention as specified in claims 2 and 12.

Regarding claims 5 and 15: Orito discloses:

- a first adding circuit (figure 5(70(portion)) of Orito) calculating a sum of output levels of said empty transfer part for predetermined pixels (1BA1...1BA8) obtained when the black correction

reference data is detected (column 8, line 62 to column 9, line 3 of Orito).

- a second adding circuit calculating a sum of output levels of said empty transfer part for the predetermined pixels (2BA1...2BA8) obtained when the black correction reference data is detected (column 8, line 62 to column 9, line 3 of Orito). The calculation of an average inherently requires the calculation of a sum. Pixels 1BA1 to 1BA8 are separate pixels since pixels 1BA1 to 1BA8 are read during separate scanning operations (column 8, lines 1-3 of Orito), and thus comprise separate pixel data (column 8, lines 13-15 of Orito).

Orito in view of Yamamoto does not disclose expressly that the output levels used by said second adding circuit are obtained when the image is read; a multiplying circuit multiplying the sum output from the second adding circuit with the black correction reference data; and a dividing circuit dividing the result of multiplication output from said multiplying circuit by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Arimoto discloses:

- a multiplying circuit multiplying a second reference level (Pave') obtained when the image is read (column 8, line 67 to column 9, line 5 of Arimoto) with correction reference data (Wave). (column 9, lines 21-25 of Arimoto).
- a dividing circuit dividing the result of multiplication output from said multiplying circuit by a first reference level (Pave) (column 9, lines 21-25 of Arimoto), and outputting the result of the division as the correction reference data after the correction (Wave') (column 9, lines 21-25 of Arimoto). Since multiplying and dividing are performed in Arimoto, some form of multiplying circuit and dividing circuit, such as digital logic circuitry or computer-readable memory used to physically embody specific routines, are inherent.

Orito in view of Yamamoto is combinable with Arimoto because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use the correction ratio taught by Arimoto, for the black correction reference taught by Orito. The motivation for doing so would have been that the originally installed reference regions deteriorate over time (column 2, lines 13-21 of Arimoto), and applying the correction taught by Arimoto eliminates this problem and allows for convenient automatic compensation for density changes in the reference level producing regions (column 2, lines 24-29 of Arimoto). Therefore, it would have been obvious to combine Arimoto with Orito in view of Yamamoto to obtain the invention as specified in claims 5 and 15.

Regarding claims 6 and 16: Orito discloses:

- a first adding circuit (figure 5(70(portion)) of Orito) calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for predetermined pixels (1BA1...1BA8) obtained when the black correction reference data is detected (column 8, line 62 to column 9, line 3 of Orito).
- a second adding circuit calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for the predetermined pixels (2BA1... 2BA8) obtained when the black correction reference data is detected (column 8, line 62 to column 9, line 3 of Orito). The calculation of an average inherently requires the calculation of a sum. Pixels 1BA1 to 1BA8 are separate pixels since pixels 1BA1 to 1BA8 are read during separate scanning operations (column 8, lines 1-3 of Orito), and thus comprise separate pixel data (column 8, lines 13-15 of Orito).

Orito in view of Yamamoto does not disclose expressly that the output levels used by said second adding circuit are obtained when the image is read; a multiplying circuit multiplying the sum output from the second adding circuit with the black correction reference data; and a dividing circuit dividing the result of multiplication output from said multiplying circuit by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Arimoto discloses:

- a multiplying circuit multiplying a second reference level (Pave') obtained when the image is read (column 8, line 67 to column 9, line 5 of Arimoto) with correction reference data (Wave) (column 9, lines 21-25 of Arimoto).
- a dividing circuit dividing the result of multiplication output from said multiplying circuit by a first reference level (Pave) (column 9, lines 21-25 of Arimoto), and outputting the result of the division as the correction reference data after the correction (Wave') (column 9, lines 21-25 of Arimoto). Since multiplying and dividing are performed in Arimoto, some form of multiplying circuit and dividing circuit, such as digital logic circuitry or computer-readable memory used to physically embody specific routines, are inherent.

Orito in view of Yamamoto is combinable with Arimoto because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use the correction ratio taught by Arimoto, for the black correction reference taught by Orito. The motivation for doing so would have been that the originally

installed reference regions deteriorate over time (column 2, lines 13-21 of Arimoto), and applying the correction taught by Arimoto eliminates this problem and allows for convenient automatic compensation for density changes in the reference level producing regions (column 2, lines 24-29 of Arimoto). Therefore, it would have been obvious to combine Arimoto with Orito in view of Yamamoto to obtain the invention as specified in claims 6 and 16.

Regarding claims 7 and 17: Orito discloses:

- a first adding circuit (figure 5(70(portion)) of Orito) calculating a sum of output levels of said empty transfer part for predetermined pixels (1BA1...1BA8) obtained when the black correction reference data is detected (column 8, line 62 to column 9, line 3 of Orito).
- a second adding circuit calculating a sum of output levels of said empty transfer part for the predetermined pixels (2BA1...2BA8) obtained when the black correction reference data is detected (column 8, line 62 to column 9, line 3 of Orito). The calculation of an average inherently requires the calculation of a sum. Pixels 1BA1 to 1BA8 are separate pixels since pixels 1BA1 to 1BA8 are read during separate scanning operations (column 8, lines 1-3 of Orito), and thus comprise separate pixel data (column 8, lines 13-15 of Orito).

Orito in view of Yamamoto does not disclose expressly that the output levels used by said second adding circuit are obtained when the image is read; and a microcomputer multiplying the sum output from the second adding circuit with the black correction reference data and dividing the result of multiplication output from said multiplying circuit by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Arimoto discloses a microcomputer (figure 1(106); and column 8, lines 34-35 and lines 59-62 of Arimoto) multiplying a second reference level (Pave') obtained when the image is read (column 8, line 67 to column 9, line 5 of Arimoto) with correction reference data (Wave) (column 9, lines 21-25 of Arimoto) and dividing the result of multiplication output from said multiplying circuit by a first reference level (Pave) (column 9, lines 21-25 of Arimoto), and outputting the result of the division as the correction reference data after the correction (Wave') (column 9, lines 21-25 of Arimoto).

Orito in view of Yamamoto is combinable with Arimoto because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use the correction ratio taught by Arimoto, for the black correction reference taught by Orito. The motivation for doing so would have been that the originally installed reference regions deteriorate over time (column 2, lines 13-21 of Arimoto), and applying the

correction taught by Arimoto eliminates this problem and allows for convenient automatic compensation for density changes in the reference level producing regions (column 2, lines 24-29 of Arimoto). Therefore, it would have been obvious to combine Arimoto with Orito in view of Yamamoto to obtain the invention as specified in claims 7 and 17.

Regarding claims 8 and 18: Orito discloses:

- a first adding circuit (figure 5(70(portion)) of Orito) calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for predetermined pixels (1BA1...1BA8) obtained when the black correction reference data is detected (column 8, line 62 to column 9, line 3 of Orito).
- a second adding circuit calculating a sum of false output levels of said empty transfer part from said empty transfer part output generating part for the predetermined pixels (2BA1... 2BA8) obtained when the black correction reference data is detected (column 8, line 62 to column 9, line 3 of Orito). The calculation of an average inherently requires the calculation of a sum. Pixels 1BA1 to 1BA8 are separate pixels since pixels 1BA1 to 1BA8 are read during separate scanning operations (column 8, lines 1-3 of Orito), and thus comprise separate pixel data (column 8, lines 13-15 of Orito).

Orito in view of Yamamoto does not disclose expressly that the output levels used by said second adding circuit are obtained when the image is read; and a microcomputer multiplying the sum output from the second adding circuit with the black correction reference data and dividing the result of multiplication output from said multiplying circuit by the sum output from said first adding circuit, and outputting the result of the division as the black correction reference data after the correction.

Arimoto discloses a microcomputer (figure 1(106); and column 8, lines 34-35 and lines 59-62 of Arimoto) multiplying a second reference level (Pave') obtained when the image is read (column 8, line 67 to column 9, line 5 of Arimoto) with correction reference data (Wave) (column 9, lines 21-25 of Arimoto) and dividing the result of multiplication output from said multiplying circuit by a first reference level (Pave) (column 9, lines 21-25 of Arimoto), and outputting the result of the division as the correction reference data after the correction (Wave') (column 9, lines 21-25 of Arimoto).

Orito in view of Yamamoto is combinable with Arimoto because they are from the same field of endeavor, namely the correction of image data through the sensing and application of background and reference data in digital image scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use the correction ratio taught by Arimoto, for the black correction reference taught by Orito. The motivation for doing so would have been that the originally

installed reference regions deteriorate over time (column 2, lines 13-21 of Arimoto), and applying the correction taught by Arimoto eliminates this problem and allows for convenient automatic compensation for density changes in the reference level producing regions (column 2, lines 24-29 of Arimoto). Therefore, it would have been obvious to combine Arimoto with Orito in view of Yamamoto to obtain the invention as specified in claims 8 and 18.

4. **Claims 3-4 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orito (US Patent 6,072,912) in view of Yamamoto (US Patent 4,841,376), Arimoto (US Patent 5,371,613), and Barron (US Patent 5,659,355).**

Regarding claims 3, 4, 13 and 14: Orito discloses that said photoelectric device comprises a contact-type sensor (column 5, lines 51-55 of Orito) which receives reflected light from an original through an optical system (column 5, lines 41-48 of Orito). The plurality of individual Charge Couple Devices (column 5, lines 51-55 of Orito) comprise the portion of the CCD sensor that directly receives the reflected light (column 5, lines 41-48 of Orito).

Orito in view of Yamamoto and Arimoto does not disclose expressly that said contact-type sensor and said optical system are both unity magnification.

Barron discloses that the closed-loop gain of the entire imaging system (figure 2 of Barron) should be set at exactly a unity gain (column 3, lines 24-29 of Barron).

Orito in view of Yamamoto and Arimoto is combinable with Barron because they are from the same field of endeavor, namely digital image data processing and correction for digital image data scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to maintain a unity gain, as taught by Barron, by ensuring that the contact-type sensor and the optical system taught by Orito are kept at a unity gain. The motivation for doing so would have been that a unity gain is necessary to calibrate the system (column 3, lines 24-27 and lines 34-38 of Barron). Therefore, it would have been obvious to combine Barron with Orito in view of Yamamoto and Arimoto to obtain the invention as specified in claims 3, 4, 13 and 14.

5. **Claims 9-10 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orito (US Patent 6,072,912) in view of Yamamoto (US Patent 4,841,376), Arimoto (US Patent 5,371,613), and Shigeeda (US Patent 5,900,948).**

Regarding claims 9 and 19: The arguments regarding claims 1 and 11 are incorporated herein.

Orito in view of Yamamoto and Arimoto does not disclose expressly an image forming device forming an image on a sheet based on the image data read by said image reading device.

Shigeeda discloses an image forming device (figure 1(15) of Shigeeda) forming an image on a sheet based on the image data read by an image reading device (column 6, lines 33-35 of Shigeeda).

Orito in view of Yamamoto and Arimoto is combinable with Shigeeda because they are from the same field of endeavor, namely digital image data processing for digital image data scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to output the resultant image data processed by the device of Orito in view of Yamamoto and Arimoto to an image forming device, as taught by Shigeeda. The motivation for doing so would have been that said image forming device provides a hard copy of the processed image (column 7, lines 1-4 of Shigeeda). Therefore, it would have been obvious to combine Shigeeda with Orito in view of Yamamoto and Arimoto to obtain the invention as specified in claims 9 and 19.

Regarding claims 10 and 20: The arguments regarding claims 2 and 12 are incorporated herein.

Orito in view of Yamamoto and Arimoto does not disclose expressly an image forming device forming an image on a sheet based on the image data read by said image reading device.

Shigeeda discloses an image forming device (figure 1(15) of Shigeeda) forming an image on a sheet based on the image data read by an image reading device (column 6, lines 33-35 of Shigeeda).

Orito in view of Yamamoto and Arimoto is combinable with Shigeeda because they are from the same field of endeavor, namely digital image data processing for digital image data scanners. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to output the resultant image data processed by the device of Orito in view of Yamamoto and Arimoto to an image forming device, as taught by Shigeeda. The motivation for doing so would have been that said image forming device provides a hard copy of the processed image (column 7, lines 1-4 of Shigeeda). Therefore, it would have been obvious to combine Shigeeda with Orito in view of Yamamoto and Arimoto to obtain the invention as specified in claims 10 and 20.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing

date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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JAT

02 January 2007

DOUGLAS Q. TRAN
PRIMARY EXAMINER

Tranlong